METTLER TOLEDO

8142PRO+

(PR07)

Industrial Terminal

Service Manual

1. Introduction

This manual describes the 8142Pro+ single display scale terminal (PRGN-XXX7) , which is tailored design to meet the vehicle and floor scale needs .

Installation and service procedure should be performed only by authorized personnel .

1.1 8142Pro+ 7 Features

- Single 7 digits numeric vacuum fluorescent displays
- 21 position keypad
- Input for up to eight 350Ω analog load cells
- The selectable increments from 1000 to 50,000
- A/D internal Resolution: 1,000,000
- Display update rate: 10 updates each second
- Pushbutton and keyboard tare
- Tare interlock function
- The expanded weight display
- Tare and clear tare automatically
- Automatic zero maintenance
- Motion detection and indication
- Center of zero indication
- Real time clock by battery back-up
- 100 truck ID/Tare record (8 digits truck ID)
- 500 transactions record (the information include CN, time and date, truck ID, gross, tare and net)
- Subtotal by truck ID
- Daily report printout
- One serial communication interface (continuous mode output)
- One parallel Centronics interface
- High accurate delta-sigma A/D converter
- TraxDSP™ vibration rejection
- SMT technology

1.2 8142Pro+ Specifications

1.2.1 Analog Load Cell

- Excitation Voltage: +10VDC, power up to eight 350Ω analog load cells
- Span range: 3 ~ 32mV
- Zero range: 0 ~ 25mV

1.2.2 Power Requirements

8142Pro+ is available in four versions, 100V, 120V , 220V and 240V . Voltage variation is from –15% to +10%, frequency is from 49Hz to 63Hz . Power consumption is 12 Watts maximum . Power is applied through a modular power plug line cord.

8142Pro+ requires a true earth ground for reliable operation.

The power line for 8142Pro+ must not be shared with equipment such as motors, relays, or heaters that generate line noise.

1.2.3 Display and Keyboard

The enclosure of 8142Pro+ is cast zinc-aluminum alloy.

The display is a 7 digits numeric vacuum fluorescent display.

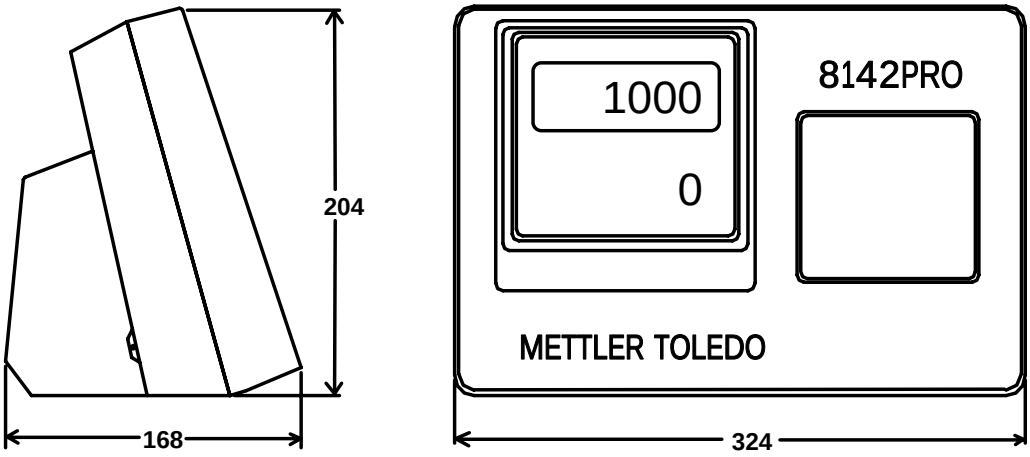
The keyboard consists of a flat membrane switch covered with a domed polyster overlay.

1.2.4 Temperature and Humidity

8142Pro+ operates over a temperature range from -10 to 40 °C at 10% to 95% humidity, noncondensing.

Storage temperature range is from -40 to 60 °C at 10% to 95% humidity, noncondensing.

1.2.5 Physical Dimension



1.3 Ordering Information

8142Pro+ MODEL CONFIGURATION ex: PRGN-1037-023					
PRGN	**X**	**X**	**X**	**X**	**XXX**
MODEL	PCB type	Reserved	Market	DISPLAY	Country
PR - 8142Pro+ G-General housing N - Numeric	1 – Analog L/C 2 - HAP	0	3- Export	7 - Single 8 – Dual	023 - CHINA

2. Installation

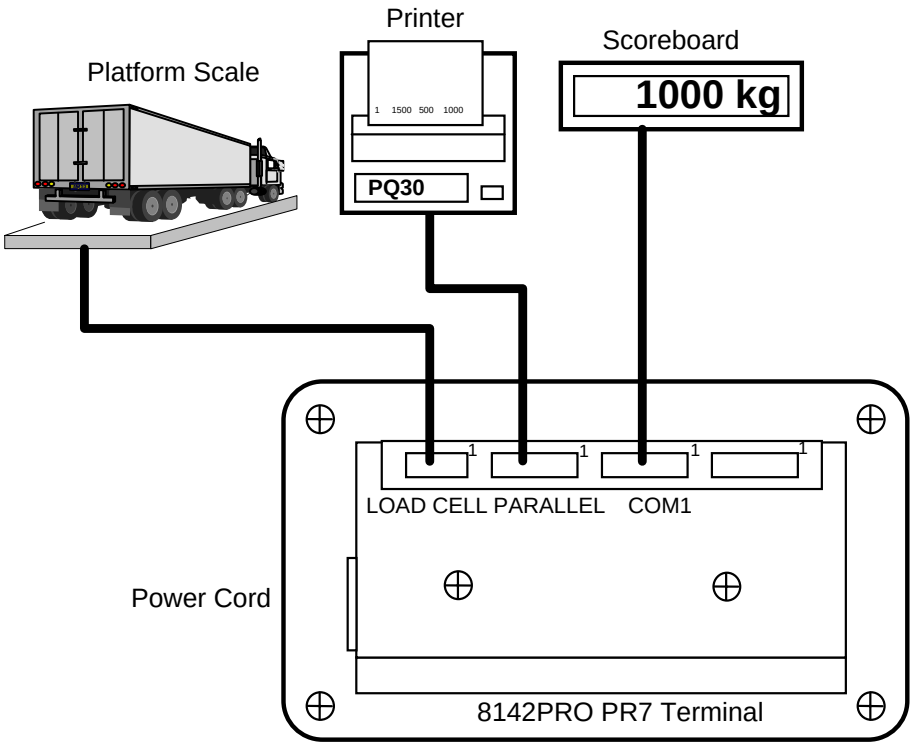
This chapter gives detailed instructions and important information you will need to install 8142Pro+ scale instrument successfully. Please read this chapter thoroughly before you begin installation.

2.1 Unpacking and Inspection

Please inspect the package as it is delivered by the carrier. If the shipping container is damaged, check for internal damage and file a freight claim with the carrier if necessary.

If the container is undamaged, unpack the 8142Pro+ scale instrument from its protective package, noting how it was packed, and inspect each component for damage.

2.2 Electrical Connections



2.2.1 Connect the Load Cell

8142Pro+ powers up to eight 350Ω analog load cells.

The wiring between 8142Pro+ and junction box is standard 6-wire cable

The analog load cell connector to the terminal is a 9 pin D-SUB female connector. The following diagram shows the pins assignments for 9 pin D-SUB connector. (Pin 9 is used to connect to the outer shield layer of cable)

SIGNAL	+EXC	+SEN	SHLD	-SEN	-EXC	+SIG	-SIG	GND
PIN	1	2	3	4	5	7	8	9

2.2.2 Serial Port COM1 Connection

The serial port COM1 consist of RS-232 and 20 mA current loop.

The maximum recommended cable length for RS-232 interface is 50 feet.

The maximum recommended cable length for 20 mA interface is 1000 feet.

The serial port COM1 connector is a 25 pin D-SUB female connector. The following diagram shows the pins assignments for COM1 connector.

SIGNAL	PIN
SHIELD GROUND	1
TXD (RS-232)	2
RXD (RS-232)	3
SIGNAL GROUND	7, 19, 22, 23
CLRX+	8, 16
CLTX+	9
CLRX-	10, 18

Note: The transmitter of 20 mA current loop is active, the receiver is passive.

Below is the pin assignment of 8142Pro+ 7 to the scoreboard .

COM1 at 8142Pro+ 7	Mettler-Toledo Scoreboard
9	1 CLRX+
7	2 CLRX-

If you want to connect your 8142Pro+ 7 to the computer , please refer to the below sheet for pin assignment .

COM1	Computer (9 pin)	Computer (25 pin)
2	2	3
3	3	2
7	5	7

2.2.3 The Parallel Interface

The parallel interface is standard Centronics printer interface. It is used to connect to a printer.

The parallel port connector is a 25 pin D-SUB female connector. The following diagram shows the pins assignments for connector.

SIGNAL	PIN
STRORE	1
DATA BIT0	2
DATA BIT1	3
DATA BIT2	4
DATA BIT3	5
DATA BIT4	6
DATA BIT5	7

SIGNAL	PIN
BUSY	11
PAPER EMPTY	12
SELECT	13
AUTO FEED	14
ERROR-	15
INIT-	16
SELECT-	17

DATA BIT6	8
DATA BIT7	9
ACK-	10

SIGNAL GND	18 ~ 25

2.3 8142Pro+ Jumper and Switch Settings

Jumper and switches on the main PCB should be set as follows:

- **K1-1** is the setup enable switch. This switch should be ON to access all setup parametersand be OFF in operation mode .
- **K1-2** is selection switch for comma. This switch should be ON to display comma (not decimal point).
- **K1-3** is used to access factory test mode. This switch is always OFF in the normal operation mode.
- **K1-4** is used to access factory test mode. This switch is always OFF in the normal operation.
- **W1** jumper should be removed for 3 mV/V, installed for 2 mV/V analog load cell.

2.4 Minimum Increment Size for Analog Scale Input

The minimum increment size selection for an analog scale input is determined by calculating the microvolts per increment for the desired build.

2.4.1 Solve the following equation for μV per increment.

$$\mu V \text{ per Increment} = \frac{\text{Increment Size} \times \text{cell output} \times \text{excitation voltage (15)} \times 1000}{\text{Load Cell Capacity} \times \text{Number of Cells or Level Ratio}}$$

The increment size, scale capacity, and load cell capacity must all be measured in the same weight units, lb or kg.

Load cell output is rated in mV/V (millivolts per volt of excitation), marked on load cell data tag. Mettler Toledo load cells are typically 2 mV/V. Other load cells can range from 1 mV/V to 4.5 mV/V.

The load cell capacity is the rated capacity marked on load cell data tag. The number of the cells is the total number of load cells in the system , for the electronic-mechanical scale , the level ratio is the total level ratio in the system .

2.4.2 Calculate the total number of increments by dividing the calibrated capacity by the increment size.

$$\text{\# Increments} = \frac{\text{Calibrated Capacity}}{\text{Increment Size}}$$

2.4.3 Microvolt build table

Use the following microvolt build table to determine if the μV per increment calculated in step 1 is within the range allowed for the total number of increments calculated in step 2. These parameters have demonstrated stable builds but smaller minimum μV per increment and larger total number of increments are possible.

Microvolt Build Table			
Total Number of Increment	Minimum µV per Increment	Maximum mV per Increment	
		2 mV/V	3 mV/V
1,000	3.0	26.0	38.0
2,000	1.5	13.0	19.0
2,500	1.2	10.4	15.2
3,000	1.0	8.7	12.7
4,000	0.75	6.5	9.5
5,000	0.6	5.2	7.6
6,000	0.5	4.4	6.4
8,000	0.375	3.3	4.8
10,000	0.3	2.6	3.8
20,000	0.15	1.3	1.9
50,000	0.1	0.52	0.76

Note: 8142Pro+ should never be programmed for least than 0.5 µV per increment when used with single load cell applications and never less than 0.1 µV per increment when used with multiple load cell applications. 8142Pro+ cannot be calibrated for builds that exceed the maximum µV per increment listed in the microvolt build rate.

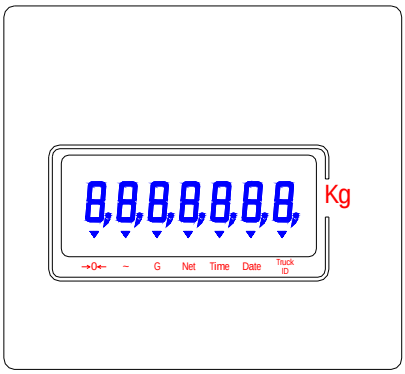
3. 8142Pro+ Operations

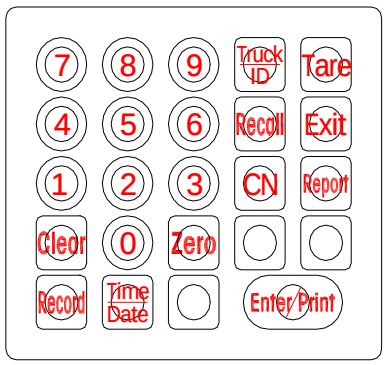
This chapter provides information that an operator will need to become familiar with the terminal and to perform its functions.

3.1 8142Pro+ Display and Keyboard

8142Pro+ single display version has one displays where scale data and operational message are presented.

This area can display up to seven numbers each with a decimal point, comma, and annunciators. The annuniciators are:





- Center-of-zero (→ o ←)

The center-of-zero annunciator indicates that the scale is within ± ¼ increment of gross zero.

- Scale in-motion (~)

The scale instability annunciator indicates that the scale is in motion. The annuniciator will turn off when the scale is stable. The motion sensitivity of motion detection is adjustable in setup.

- Weighing mode (Gross or NET)

The 8142Pro+ will be in Net mode when a tare is active. Tare can be entered as a Preset tare value or tare may be automatically acquired when the operator presses the TARE key.

- Truck ID

The truck ID annunciator indicates that you are entering a truck identification.

- TIME/DATE

The time annunciator indicates TIME has been displayed. The date annunciator indicates DATE has been displayed.

8142Pro+ 7 is equipped with a 21-key keypad as shown in the picture :

The keypad consists of numeric keys 0 through 9 and eleven function keys.

The keys perform the following functions:

- **NUMERIC** keys are used to input numbers.
- **ZERO** zeros the scale. The ZERO key also functions as backspace when entering data from the keypad.
- **TARE** performs a pushbutton tare or keyboard tare if enabled in setup.
- **CLEAR** clears a tare value and returns the scale to gross mode. The CLEAR key also functions as delete when entering data from the keypad.
- **Truck ID** acknowledges a prompt and accepts data as truck ID entered from the keypad.
- **CN** key is used to recall consecutive number.
- **RECALL** is used to recall consecutive number or accumulations.
- **TIME/DATE** key is used to enter or recall the clock and the date.
- **REPORT** can generate and print truck-related reports.
- **RECORD** key is used to store a weighing transaction.
- **ENTER/PRINT** acknowledges a prompt and accepts data entered from the keypad. It also initiates a demand print output.

3.2 The Basic Operator Functions

3.2.1 Power-up Sequence

8142Pro+ goes through a series of self- tests when it is turned on. These self- tests confirm normal operation. The power-up sequence is as follows:

1. All segments of the display are lit. This verifies operation of all segments.
2. 8142Pro+ displays the software part number " 131105 " and revision number "L x.x".
3. 8142Pro+ performs internal power-up tests, verifies internal memory,
4. Finally, if the terminal pass self-test , it will returns to normal operating mode.

3.2.2 Zero the Scale

If pushbutton zero is enabled, you can press ZERO key to establish a new zero center of reference for the scale when in the gross mode. In motion or residual weight on scale greater than pushbutton zero range will cancel this operation.

3.2.3 Tare Operation

8142Pro+ supports pushbutton tare, preset (keyboard) tare and clear tare operations.

- Pushbutton Tare
  In gross mode, place the container to be weighed on the platform and press the TARE key, The 8142Pro+ reads 0.0 with the NET annunciator illuminated.
- Preset (keyboard) Tare
  Preset tare, sometimes called keyboard tare, compensates for a known tare weight on the scale. Preset tare is used when the net weight of contents in a filled container must be determined and the tare weight is known.
  1. Place the load on the platform. The display shows the gross weight of the load. Be sure you know the weight of the portion to be compensated for by preset tare.
  2. Use the numeric keys to enter the known tare weight (the number entered should be the multiple of the increment size) , then press TARE key. The net weight of the load is displayed with an annunciator indicating NET.
- Clear Tare
  Clear tare by pressing CLEAR key. 8142Pro+ returns to gross mode and displays the gross weight on the platform.

3.2.4 Print Operation

In normal operating mode, demand printing is initiated when an operator presses the ENTER/PRINT key. During demand print output, " P--- " will be displayed.

3.3 Truck ID/Tare Operation

3.3.1 Entering a Truck ID/Tare

- Entering an unknown tare weight

1. Place a load to be tared on the platform.
2. Press TRUCK/ID key , the display window shows " id " prompt message .
3. Use the numeric keys to enter the truck number, then press TARE key. The truck number and the related tare will be stored.

- Entering a known tare weight

1. Press TRUCK ID key, 8142Pro+ display "id " prompt.

2. Use the numeric keys to enter the truck number, then press ENTER key. 8142Pro+ accept the truck ID, the window shows " 0 " and lit the TARE annunciator ,

3. Use the numeric keys to enter the tare value, make sure the figure is the multiple of the increment size . then press TARE key. The truck number and tare will be stored.

Note : The maximum of the TRUCK/ID is 100 . If the display shows " id FULL " , that means the terminal will not accept the new Truck /ID .

If the terminal display blinks the total number of the Truck/ID , that means the Truck/ID record transaction is valid . No blink means invalid transaction .

3.3.2 Recall a Truck ID/Tare

1. Press TRUCK ID key, 8142Pro+ display "id " prompt.

2. Use the numeric keys to enter the truck number, then press ENTER key. Display shows the truck tare weight corresponding to the truck .
3. Press TARE key, 8142Pro+ recall the tare value corresponding to the above entered TRUCK ID, then return to net operating mode from Gross mode .

3.3.3 Display a Temporary Truck ID/Tare

1. Press TRUCK ID key, 8142Pro+ display “id ” prompt.
2. Use the numeric keys to enter the truck number, then press ENTER key, the display shows the stored tare corresponding to the stored TRUCK ID.
3. Press ENTER key, the 8142Pro+ will return to the normal operating mode.

3.3.4 Clear Truck ID/Tare

- Clear All Truck ID/Tare

1. Press TRUCK ID key, 8142Pro+ display “id “ prompt.
2. Press CLEAR key, the display shows “Clr ALL?” prompt.
3. Press “1” to clear and “0” or EXIT key to cancel the operation.

- Clear a Truck ID/Tare

1. Press TRUCK ID key, 8142Pro+ display “id “ prompt.
2. Use the numeric keys to enter the truck number, then press ENTER key to terminate the number entry .
3. Press CLEAR key, the display showes “Clr it ?” prompt.
4. Press “1” to clear and “0” or EXIT key to cancel the operation.

3.4 Recording a Weighing Transaction

3.4.1 Recording a Weighing Transaction

1. With the truck on the platform .
2. Press RECORD key, 8142Pro+ display “id “ prompt.
3. Use the numeric keys to enter the truck ID, then press ENTER key. 8142Pro+ will recall the tare weight of this truck and go into Net mode . If no truck ID entry , just press “ ENTER” to skip .

4. Press ENTER/PRINT key, 8142Pro+ will display “ PS--- ” , that means to store a weighing transaction and initiate a demand print output.

Note : The maximum transaction for 8142Pro+ 7 to record is 500 , “ db FULL ” stands for the memory is full and can’t accept new transaction .

3.4.2 Clearing All Weighing Transactions

1. Press REPORT key, 8142Pro+ display “total “ prompt.
2. Press CLEAR key, the display showes “Clr ALL” prompt.
3. Press “1” to clear and “0” or EXIT key to cancel the operation.

3.5 Report Operation

3.5.1 Report by Truck ID

1. Press REPORT key, 8142Pro+ display “total “ prompt.
2. Press TRUCK ID key, the display show “id ” prompt.
3. Press PRINT key, 8142Pro+ print out the following

   TRUCK ID - TRANSACTION table.

DATE/TIME: 1999/02/26 08:26

CN	TRUCK ID	TARE (kg)	SUBTOTAL (kg)	TRANSACTIONS
1	12345678	1250	24600	26
2	13579	530	578960	580
3	24680245	2680	4600	2

TOTAL: 608160 kg TOTAL TRANSACTIONS: 608

3.5.2 Report by Date

1. Press REPORT key, 8142Pro+ display “total “ prompt.
2. Press ENTER key, the display show “dAtE ” prompt.
3. Use the numeric key to enter 4-digits date (month and day).
4. Press PRINT key, 8142Pro+ print out the following TRANSACTION table.

DATE: 1999/02/26

CN	TIME	TRUCK ID	CARGO ID	CLIENT ID	GROSS(kg)	TARE(kg)	NET(kg)
1	08:10	12345678	03	15	3250	1200	2050
2	09:20	24680	16	01	24360	7650	16710
3	09:25	2468310	08	20	5800	850	5950

Accumulated Gross: 33410 kg Accumulated Net: 24710 kg

3.6 Recall Operation

3.6.1 Recall CN (Consecutive Number)

1. Press RECALL key, 8142Pro+ display “rECALL “ prompt.
2. Press CN key, 8142Pro+ display the next CN “Cn 0021”.
3. Press any key, 8142Pro+ returns to normal operating mode.

Note : The CN is automatic generated by 8142Pro+ , and you can’t change that by yourself . The CN will come back to 1 after the transaction are all cleared .

3.6.2 Recall Total

1. Press RECALL key, 8142Pro+ display “rECALL “ prompt.

2. Press REPORT key, 8142Pro+ display the current accumulated value. Since Pro7 only has 7 digits , if the accumulated value is more than 7 digits , the rest of them will be displayed first for 3 seconds and then display the least significant 7 digits .

3. Press any key, 8142Pro+ returns to normal operating mode.

3.6.3 Recall Subtotal by Truck ID

1. Press RECALL key, 8142Pro+ display “rECALL “ prompt.
2. Press TRUCK ID key, 8142Pro+ display “id ” prompt.
3. Use the numeric key to enter truck ID, then press ENTER key. 8142Pro+ display the current truck ID - related subtotal.
4. Press ENTER key, 8142Pro+ display the current truck ID-related transaction times of be accumulated.
5. Press any key, 8142Pro+ returns to normal operating mode.

4. Programming and Calibration

This chapter discusses 8142Pro+ ’s parameters setting and calibration. Please read this chapter thoroughly before you begin programming and calibration.

4.1 Entering Parameters Setting and Calibration

Openning the enclosure, set the K1-1 to “ON” position.

8142Pro+ shows “F1 ” automatically to express it has been in the setup mode.

In the setup mode, The following several keys can be used to access programming and calibration.

“0”	Used to display the next selectable value.
“ZERO”	Used to back up in the current program block and return to the previous step.
“EXIT”	Used to exit back to the first step of the current block or of the previous block .
“ENTER”	Used to complete a response and display the next parameter.
Numeric Keys	Used to input numeric entries such as scale capacity.

4.2 Parameters Setting

[F1] Scale Interface Program Block

[F1.1] Scale Capacity

Entering the desired scale capacity using the numeric keys, then press “**ENTER”** key. In the normal operating mode, if the weight on scale exceeds 9 increments over capacity, 8142Pro+ will display over-capacity message “ ┌─────┐ ”. The scale capacity is only entered according to the following Table 1, other scale capacities can not be accepted.

4.2.1 Table 1: Scale capacity selection

	Total Increments

Inc.	1000d	2000d	2500d	3000d	4000d	5000d	6000d	8000d	10000d	20000d	50000d
0.001	1	2	-	3	4	5	6	8	10	20	50
0.002	2	4	5	6	8	10	12	16	20	25	100
0.005	5	10	-	15	20	25	30	40	50	100	250
0.01	10	20	25	30	40	50	60	80	100	200	500
0.02	20	40	50	60	80	100	120	160	200	400	1000
0.05	50	100	125	150	200	250	300	400	500	1000	2500
0.1	100	200	250	300	400	500	600	800	1000	2000	5000
0.2	200	400	500	600	800	1000	1200	1600	2000	4000	10000
0.5	500	1000	1250	1500	2000	2500	3000	4000	5000	10000	25000
1	1000	2000	2500	3000	4000	5000	6000	8000	10000	20000	50000
2	2000	4000	5000	6000	8000	10000	12000	16000	20000	40000	100000
5	5000	10000	12500	15000	20000	25000	30000	40000	50000	100000	250000
10	10000	20000	25000	30000	40000	50000	60000	80000	100000	200000	500000
20	20000	40000	50000	60000	80000	100000	120000	160000	200000	400000	-
50	50000	100000	125000	150000	200000	250000	300000	400000	500000	-	-

[F1.2 5] Increment Size

Press “0” key to toggle through valid selections. The available increment size are 0.001, 0.002, 0.005, 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20 and 50.

[F1.3 X] Linearity Correction

X = 0 Disable linearity correction
X = 1 Enable linearity correction

[F1.4 X] Zero Adjustment

X = 0 Disable zero adjustment
X = 1 Enable zero adjustment, 8142Pro+ shows [E SCL] prompt. Remove any weight on the platform and press “ENTER” key.

8142Pro+ automatically proceeds to capture zero and the display count down from 15 to 0, then advances to the next parameter setting.

[F1.5 X] Span Adjustment

X = 0 Disable span adjustment
X = 1 Enable span adjustment, 8142Pro+ shows [Add Ld] prompt.
Place a test weight on the platform and press “ENTER” key.

At the [00000] prompt, enter the amount of weight placed on the platform, then press “ENTER” key, 8142Pro+ automatically proceeds to capture the new span and the display count down from 15 to 0, then advances to the next parameter setting.

Note : Before performing the span adjustment , the test weights should have been placed on the platform in operating mode , then put K1-1 at “ ON ” and 8142Pro+ enter into setup mode in order to perform span adjustment .

[F1.6 X] Calibration

X = 0 Disable calibration
X = 1 Enable calibration.

Calibration involves emptying the scale then placing a known test weight on an empty platform and allowing the 8142Pro+ to capture values for zero and span. You can calibrate a scale with or without linearity correction. 8142Pro+ prompts you through the calibration.

- **[F1.3 = 0] Without Linearity Correction**

[E SCL] Remove any weight on the platform, then press "ENTER" key, 8142Pro+ automatically capture zero and the display count down from 15 to 0.

[Add Ld] Place a test weight on the platform, then press "ENTER" key.

[00000] Enter the amount of test weight you added then press "ENTER" key. 8142Pro+ automatically capture span and the display count down from 15 to 0. When the calibration completed, the display shows [CAL d], then continue to the next parameter setting.

- **[F1.3 = 1] With Linearity Correction**

[E SCL] Remove any weight on the platform, then press "ENTER" key, 8142Pro+ automatically capture zero and the display count down from 15 to 0.

[Add Hi] Place a test weight on the platform equaling at least 60% of scale capacity, then press "ENTER" key.

[00000] Enter the amount of test weight you added above then press "ENTER" key. 8142Pro+ automatically capture full scale and the display count down from 15 to 0.

[Add Lo] Place some test weight on the platform, make the test weight on the platform equaling between 30% and 60% of the scale capacity.

[00000] Enter the amount of test weight on the platform then press "ENTER" key. 8142Pro+ automatically capture mid-scale and the display count down from 15 to 0. When the calibration completed, the display shows [CAL d], then continue to the next parameter setting.

[F1.7 X] The Expanded Weight Display

X = 0 Normal weight display mode
X = 1 Weight displayed in minors , 1 displayincrement=10 minors

[F2] Application Environment Program Block

[F2.1 X] The Power-up Time Delay

X = 0 Disable the power-up time delay
X = 1 The power-up time delay is 10 minutes
X = 2 The power-up time delay is 20 minutes
X = 3 The power-up time delay is 30 minutes

[F2.2] Zero Operation

Select "ENTER" key to enter zero operation or select "0" key to skip without zero operation.

[F2.2.1 X] Power-up Zero Operation

X = 0 Power-up zero disabled
X = 1 Enable power-up zero within ±2% FS range
X = 2 Enable power-up zero within ±20% FS range

[F2.2.2 X] Pushbutton Zero Operation

X = 0 Pushbutton zero disabled
X = 1 Enable pushbutton zero within ±2% FS range
X = 2 Enable pushbutton zero within ±3% FS range
X = 3 Enable pushbutton zero within ±20% FS range

[F2.2.3 X] Auto Zero Maintenance

X = 0 AZM disabled
X = 1 AZM within ±0.5d window
X = 2 AZM within ±1.0d window
X = 3 AZM within ±3.0d window

[F2.3] Tare Operation

Select "ENTER" key to enter tare operation or select "0" key to skip without tare operation.

[F2.3.1 X] Enable Tare

X = 0 Tare disabled
X = 1 Tare enabled

[F2.3.2 X] Tare Interlock

X = 0 Tare interlock disabled
X = 1 Tare interlock enabled

[F2.3.3 X] Auto Tare

X = 0 Auto tare disabled
X = 1 Auto tare enabled , if the weight is more than 5d and in stable condition , 8142Pro+ will auto-tare .

[F2.3.4 X] Auto Clear Tare

X = 0 Auto clear tare disabled
X = 1 Auto clear tare enabled , if the scale is in gross zero , and 8142Pro+ will auto clear tare .

[F2.3.5 XX] Keyboard Tare

Enter the range of the keyboard tare , XX is the percent of FS , XX =0 means keyboard tare disabled .

[F2.4 X] Motion Sensitivity

X = 0 Motion detector disabled
X = 1 ±1.0d motion sensitivity

X = 2 ±3.0d motion sensitivity

[F2.5 2.0] Digital Filter

X.X is the number data entry for the low pass filter corner frequency (0.5 ~ 9.9).

[F2.5.1 X] Noise Filter Enable/Disable

X = 0 Disable noise filter
X = 1 Enable noise filter

[F3] COM1 Program Block

[F3.1] Baud Rate

[XXXX] XXXX = a selection list of 300, 1200, 2400, 4800 or 9600 baud rate.

[F3.2 X] Data Bits

X = 7 7 data bits
X = 8 8 data bits

[F3.3 X] Parity

X = 0 No parity
X = 1 Odd parity
X = 2 Even parity

[F3.4 X] Checksum

X = 0 Disable checksum
X = 1 Enable checksum

[F3.5 X] Serial Data Out

X = 0 None
X = 1 Continuous mode
X = 2 Demand mode , single line gross , tare , net weights

[F3.6 X] Discrete ASCII input

X = 0 Disable
X = 1 Enable discrete ACSII demand input
Z = Zero
T = Tare
C = Clear
P = Print

[F5] Centronics Interface Program Block

[F5.1 X] Printer Selection

X = 0 80 column printer
X = 1 40 column printer , (only for single ticket format)

[F5.2 X] Printer Data Format

X = 0 Format A
X = 1 Format B
X = 2 Format C

Note : If F5.1 = 1 , then F5.2 will be 0 (format A) automaticlly , only single ticket format available .

[F5.3 X] Print the title of the ticket

Enter the title of the ticket up to 30 ASCII code in numerical data .

[F5.4 X] Autoprint enable

X = 0 Disable autoprint
X = 1 Enable autoprint

[F5.4.1 X] Print threshold

Enter the minimum print weight value , in another words , the indicator will not initiate the print command if the weight is lower than the threshold value .

[F5.4.2 X] Reset threshold

Enter the reset threshold value , that value means if the weights on the platform fall lower than the threshold value then above , it will enable the autoprint , otherwise , no output .

[F6] Operation Program Block

[F6.1 X] Truck ID/TARE

X = 0 Truck ID/TARE disabled
X = 1 Truck ID/TARE enabled

[F7] Diagnostics and Maintenance Program Block

[F7.1 X] Memory Test

X = 0 Disable memory test
X = 1 Enable memory test, 8142Pro+ tests the 8142Pro+ 's internal memory. The memory test includes the program memory, internal RAM of CPU, external RAM and EEPROM on the main board. The results of the memory tests are displayed on the 8142Pro+ and advances to next parameter setting.

[F7.2 X] Display Test

X = 0 Disable display test

X = 1 Enable display test, 8142Pro+ goes through a display test sequence. The display test sequence includes all segments of the display windows are lit, then shows the software part number and revision number and advances to next parameter setting.

[F7.3 X] Keyboard Test

X = 0 Disable keyboard test
X = 1 Enable keyboard test. Press "ENTER" key to show the value of a key to be pressed, press "EXIT" to exit keyboard test.

[F7.4 X] Scale Calibration Factor Test

X = 0 Disable the display of scale calibration factor
X = 1 Enable the display of scale calibration factor. Press "ENTER" key to show the empty scale reading.

[FinE0] The Display shows prompt for 2 seconds , then
[xxxxx] The Display shows the empty scale reading

- Press "ENTER" key to show the span reading

[SPA1] The Display shows prompt for 2 seconds and then ,
[xxxxx] The Display shows the MSD of the span reading

- Press "ENTER" key to show the span reading

[SPA2] The Display shows prompt for 2 seconds , then :
[xxxxx] The Display shows the LSD of the span reading

[F7.5 X] Serial Interface Test

The Serial Interface Test tests the serial ports COM1 or COM2. You can shorten TXD and RXD, the 2 digits on the left shows the transmitted data, the 2 digits on the right shows the received data. 8142Pro+ scrolls from 1 to 99. If the data is equal , that means the serial port is working fine . The serial interface test is useful in hardware diagnostics. Press " Exit " for exit the test .

[F7.5.1 X] COM1 Test

X = 0 Disable COM1 test
X = 1 Enable COM1 test

[F7.6 X] Centronics Interface Test

X = 0 Disable Centronics interface test
X = 1 Enable Centronics interface test ,
Before test , connect 8142Pro+ with a printer with Centronics parallel port , and the printer will print prompt message "Parallel Port Test Complete" to show the test is OK , if 8142Pro+ shows error message , that means something wrong with the port .

[F7.7 X] Programming and Calibration Parameters Print-out

X = 0 Print setup and calibration parameters disabled
X = 1 Print setup and calibration parameters through Centronics parallel port .

[F7.8 X] Reset to Factory

X = 0 Disable reset to factory
X = 1 Enable reset to factory default , 8142Pro+ shows **[LoAd X]** prompt

[LoAd 0] Exit without resetting all parameters
[LoAd 1] Confirm your intention to reset

Reset to Factory performs a master reset which returns all of the parameters to their original factory settings. Refer to Appendix 2.

4.3 Exiting Parameters Setting and Calibration

Press “EXIT” key, 8142Pro+ shows [CAL OFF]
Press “ENTER” key, 8142Pro+ shows [1-1 OFF]
Open the front cover of 8142Pro+ , slide the “K1-1” to “OFF” position, 8142Pro+ will return to normal weighing mode

5. Service and Maintenance

8142Pro+ is designed for durability and should require a minimum of maintenance or service. This chapter provides information on service and maintenance.

5.1 Tools and Supplies

- Volt-Ohm meter
- Analog load cell simulator
- Soft, lint-free cleaning cloth
- Anti-static wrist strap and mat
- Flat and Phillips head screw driver

5.2 Clearing and Regular Maintenance

You may wipe the keyboard and covers with a clean, soft cloth that has been dampened with a mild glass cleaner. Do not use any type of industrial solvent such as toluene or isopropanol (IPA) on the keyboard/display assembly of the 8142Pro+ . Solvents may damage the keyboard/display and/or cover finish. Do not spray cleaner directly onto the unit.

Regular maintenance inspections by a qualified service technician are also recommened.

5.3 Troubleshooting

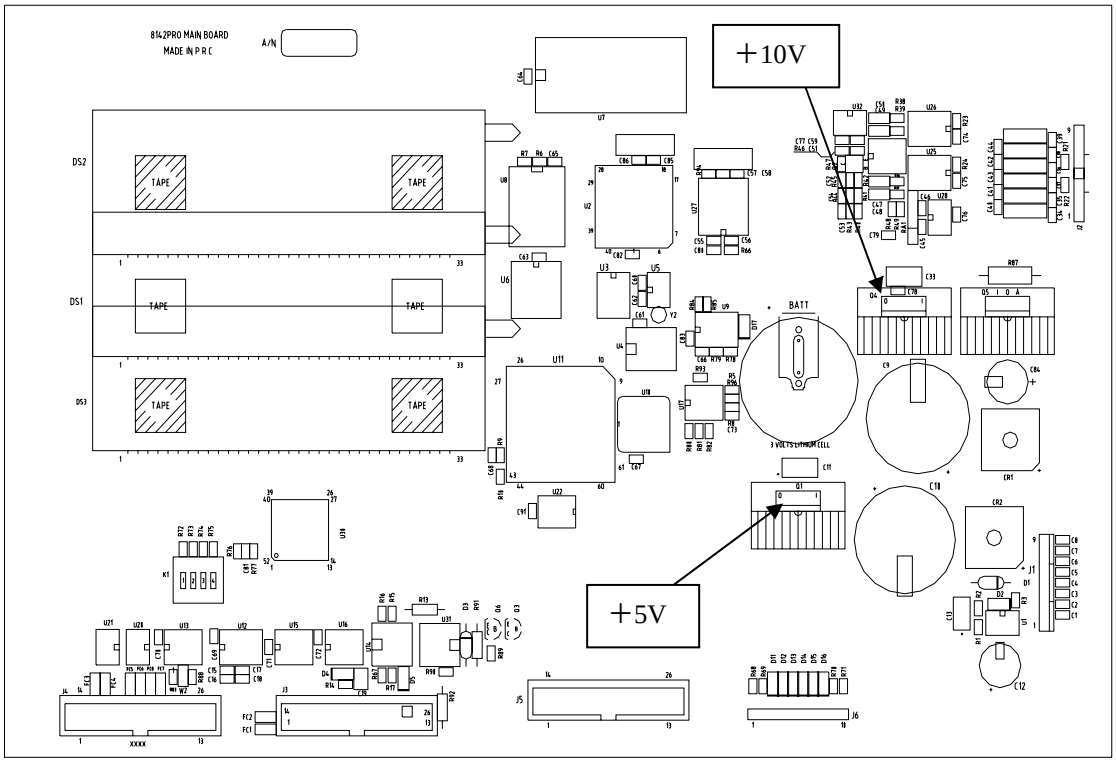
8142Pro+ is designed to be virtually error free and reliable. If problems do occur, do not attempt to repair the scale or indicator before you have determined the source of the problem. Begin by performing the diagnostic tests described in Chapter 4. If the problem persists, you can use the error codes table below to help identify the problem.

5.4 Error Codes and Actions

The following table lists the 8142Pro+ 's error messages with possible cause, and remedy.

Error Code	Description	Remedy
E 1	Fatal EPROM memory error.	1. Power down and back up. 2. Replace EPROM.
E 2	Fatal internal RAM error.	1. Power down and back up. 2. Replace CPU.
E 3	EEPROM memory error.	1. Power down and back up. 2. Replace EEPROM.
E 4	Fatal external RAM error.	1. Power down and back up. 2. Replace external RAM.
E 7	A/D converter error.	1. Power down and back up. 2. Replace main PCB
E 32	Insufficient calibration test weight or insufficient signal from load cell.	1. Add additional test weight.
E 34	Calibration test weight too large	1. Decrease test weight.
E 35	Illegal test weight build entry	1. Making sure the test weight value entered is a multiple of the setup increment.
E 36	The A/D is overcapacity	1. Power down and back up. 2. Replace main PCB.
E 37	The scale is in-motion.	1. Re-calibration.
E 61	No paper of printer.	
E 62	The printer is busy.	
E 63	The printer is error	
E 64	The printer is interrupt.	
E 65	Printer controller error	
db FuLL	Data memory overflow	Delete transaction record.
id FuLL	Truck ID/TARE overflow	Delete unnecessary Truck ID/TARE.
┌‾‾‾‾┐	Overcapacity indication	
————	Power warm-up overtime	
└____┘	Undercapacity indication.	

5.5 Testing Operational Voltages



5.6 Battery

There is a rechargeable lithium battery on the 8142Pro+ . The battery powers real time clock and external memory chips. 8142Pro+ automatically charge the battery when 8142Pro+ is powered up.

Appendix A : Print format

Three formats available when you select the 80 column printer , Format A,B & C for different requirements :

A.1 Format A

Format A is three tickets , below is the example :

WEIGHING TICKET 1

CN	0081
TIME	13:14:19
DATE	1999/11/20
CARGO	
CLIENT	
GROSS	5721 kg
TARE	0 kg
NET	5721 kg

WEIGHING TICKET 2

CN	0081
TIME	13:14:19
DATE	1999/11/20
CARGO	
CLIENT	
GROSS	5721 kg
TARE	0 kg
NET	5721 kg

WEIGHING TICKET 3

CN	0081
TIME	13:14:19
DATE	1999/11/20
CARGO	
CLIENT	
GROSS	5721 kg
TARE	0 kg
NET	5721 kg

A.2 Format B

METTLER-TOLEDO

CN	DATE&TIME	ID	CARGO	CLIENT	GROSS(kg)	TARE(kg)	NET(kg)
0073	99/11/20 13:04	111			1106	10	1096

METTLER-TOLEDO

CN	DATE&TIME	ID	CARGO	CLIENT	GROSS(kg)	TARE(kg)	NET(kg)
0074	99/11/20 13:08	123			1659	10	1649

Note : The title “ METTLER-TOLEDO ” can be compiled to other words through [F5.3] .

A.3 Format C

METTLER-TOLEDO

CN	DATE&TIME	ID	CARGO	CLIENT	GROSS(kg)	TARE(kg)	NET(kg)
001	99/12/20 13:08	1			1660	10	1650
002	99/12/20 13:10	10			5210	20	5190
003	99/12/26 13:30	25			1260	60	1200
004	99/12/31 12:59	123			5000	500	4500

……

Note : The title " METTLER-TOLEDO " can be compiled to other words through [F5.3] .

A.4 Format for Mini-printer

One ticket format is available for mini-printer , and it is the only format when select [F5.1]=1 . The format is the one out of three sheets of format A .

WEIGHING TICKET 1

CN	0081
TIME	13:14:19
DATE	1999/11/20
CARGO	
CLIENT	
GROSS	5721 kg
TARE	0 kg
NET	5721 kg

Appendix B : Continuous mode output

The continuous output format is output as the display is updated . The format is fixed except for baud rate, data bits, stop bits, parity, and the selectable checksum character. The continuous output mode provides compatibility with METTLER TOLEDO products that require real-time weight data (for example, Models 8624, 9323, 9325, and 9360 accessories) .

Continuous data output at a 1200 baud rate will slow the display update rate. Use 4800 baud or faster to maintain the maximum update rate.

The continuous output includes status bytes that indicate the operating conditions in the terminal.

Character	1	Status			Displayed Weight						Tare Weight							
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1
Data	STX	SWA	SWB	SWC	MSD	-	-	-	-	LSD	MSD	-	-	-	-	LSD	CR	CHK
Note	A	B			C						D						E	F

Table B-1 : Continuous mode output

Continuous Format Notes

A ASCII Start of Text <STX> character, hex value 02.

B SWA, SWB, and SWC: Status Words A, B, and C. Refer to Tables 6-9, 6-10, and 6-11 for status bytes.

C Displayed weight: Six digits of displayed weight. No decimal point in field.

D Tare weight: Six digits of tare weight data. No decimal point in field.

E ASCII Carriage Return <CR> character, hex value OD.

F Optional checksum character: Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> characters.

Status Byte Definition

Status Word A			
Bits0,1,2			
0	1	2	Decimal point
0 1	0 0	0 0	XXXX00 XXXXX0
Bits3,4			
3	4		Increment size
1 0	0 1		X1 X2
Bit5			Always 1
Bit6			Always 0

Table B-2 : Status Word A Bit Definitions

Status Word B	
Bits	Function
Bit0	Gross=0 , Net=1
Bit1	Positive = 0, Negative = 1
Bit2	Overcapacity (or under zero)=1
Bit3	Motion=1
Bit4	Unit : kg=1
Bit5	Always = 1
Bit6	Power up =1

Table B-3 : Status Word B Bit Definitions

Status Word C	
Bit0	Always 0
Bit1	Always 0
Bit2	Always 0
Bit3	Print request =1
Bit4	Expanded weight =1
Bit5	Always 1
Bit6	Always 0

Table B-4 : Status Word C Bit Definitions

Appendix C: 8142Pro+ Factory Default Setting

F1	Scale Interface	Default
F1.1	Scale capacity	10000
F1.2	Increment size	1
F1.3	Linearity	0
F1.4	Zero adjustment	0
F1.5	Span adjustment	0
F1.6	Calibration	NA
F1.7	Expanded display	0
F2	**Environment**	
F2.1	Power up delay	0
F2.2	Zero operation	
F2.2.1	Power up zero capture	1
F2.2.2	Pushbutton zero range	3
F2.2.3	AZM	1
F2.3	Tare operation	
F2.3.1	Tare enable	1
F2.3.2	Tare interlock	0
F2.3.3	Auto Tare	0
F2.3.4	Auto Clear	0
F2.3.5	Keyboard Tare enable	99
F2.4	Motion detect	1
F2.5	Digital filter	2.5
F2.5.1	Noise filter	1

F3	Configuration Com1	
F3.1	Baud rate	1200
F3.2	Data bits	7
F3.3	Parity	2
F3.4	Checksum	0
F3.5	Serial data out	1
F3.6	Discrete input	0
F5	**Configure Parallel**	
F5.1	Printer selection	0
F5.2	Print format selection	0
F5.3	Ticket literal	0
F5.4	Auto print	0
F6	**Operation program**	
F6.1	Truck ID function	1
F7	**Diagnostic**	
F7.1	Memory test	NA
F7.2	Display test	NA
F7.3	Keyboard test	NA
F7.4	Calibration factor	NA
F7.5	Serial port test	NA
F7.6	Parallel port test	NA
F7.7	Print setup parameter	NA
F7.8	Reset factory default	NA

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Quality Certificate

Development,production,testing of this product according to the ISO9001/NO.0197A015 & ISO14001/NO.06-2000-52

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